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THE RELATIONSHIP BETWEEN AIR POLLUTION AND THE HEALTH OF SCHOOL CHILDREN IN NAGOYA CITY

by

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Objective

For the purpose of ascertaining the effects caused by air pollution on school children, a city-wide health survey was conducted on the students of elementary and junior high schools of Nagoya and the results were studied in an attempt to grasp the existing conditions.

Method of Survey

The survey was conducted using questionnaires distributed among 15224 males and females of elementary school grades 3, 4, 5 and 6, and 10313 males and females of first and second years of junior high from 25 elementary schools and 17 junior high schools selected from the City of Nagoya, to make a total of 25537. At the same time, results of medical examinations, physical checkups and athletic aptitude tests were studied and compared. The survey was conducted in January and February of 1971. For the questionnaires, class teachers were

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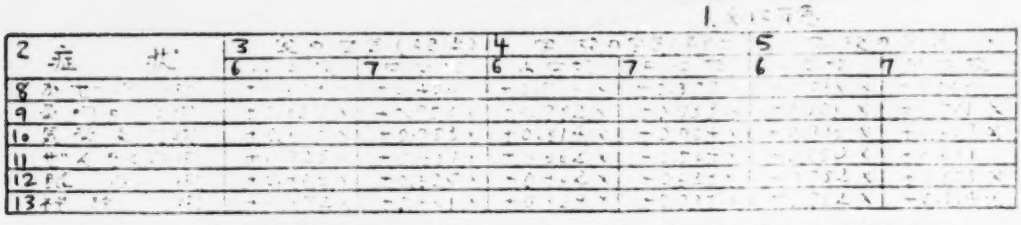
asked to have their students fill in appropriate items. The survey items included the duration of residence at present domicile, its environment, the state of air pollution in the vicinity of home and school, unusual odors in the vicinity of school, physical condition, the presence or absence of asthma, the presence or absence of incidence of disease or illness and health measures taken at home. The information for medical examinations and physical checkups was based on data obtained from tests conducted at the schools in question in the spring of 1970. The study of athletic aptitude tests was conducted on the basis of the results from a low-platform climbing and descending test for elementary school 5th and 6th graders and first and second year junior high students, and an endurance run test for first and second year junior high students, which were carried out at the schools in question.

Survey Results

With respect to air pollution, those who were aware of pollution around their domicile constituted 40% of both the elementary and junior high school students, and similar results were obtained for those who were aware of pollution around their school. No difference was observed between the sexes, and, generally speaking, there was a tendency for pollution to become more serious in the industrial belt in the southern part of the City of Nagoya. With regard to unusual odors around school, the complaint rate for both elementary and junior high school students was 68%, and the schools with high complaint rates were mostly in industrial belts in the sounthern part and northern part of the City. Under physical condition, the complaint rate for cold symptoms showed an average of 29% for elementary schools and an avaerage of 32% for junior high schools, with more complaints from girls in both cases. The complaint rates for nose and throat symptoms were 26% for elementary schools and 22% for junior high schools, with no difference observed between the sexes. Similar results were obtained for complaints of bronchial symptoms. With every one of the complaint rates, the figures were high in the industrial belt in

the southern part of the City and low in the residential region in the northeastern part of the City. In addition, there are clear correlations between complaints of air pollution and odors and these symptoms as indicated by the table below.

Correlations between complaints of air pollution and various symptoms



Key:
1. * indicates significant
2. Symptom
3. Air at home (percentage replying quality bad)
4. Air at school (percentage replying quality bad)
5. Odors at school
6. Elementary schools
7. Junior high schools
8. Cold symptoms
9. Nose and throat symptoms
10. Bronchial symptoms
11. Asthmatic symptoms
12. Ophthalmic symptoms
13. Nervous symptoms

Although there are significant differences in the results of medical examinations from school to school, there was a tendency for the incidence of tonsilitis to be more frequent in the industrial belt in the southern part of the City. No significant differences were observed in height, weight or chest measurement. With the athletic aptitude tests, no clear difference was observed among the schools in terms of the index figures for the low-platform climbing and descending test, but in the case of the endurance run test for junior high schools, a clear deterioration in the aptitude was observed for both males and females of schools in polluted areas in comparison to schools in non-polluted areas.

Conclusion

In the areas of air pollution, so defined on the basis of complaints from school children of elementary and junior high schools in

which those of residence of over 9 years comprise a majority, the complaint rates for respiratory symptoms and ophthalmic symptoms were higher compared to non-polluted areas. In addition, while no clear relationship between the presence or absence of pollution and physical size or the index figures for the low-platform climbing and descending test can be observed, the performance of both males and females in the endurance run test was clearly inferior in the polluted areas. From this, it is deduced that air pollution is having some sort of effect on the health of the school children.